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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,777	03/21/2006	Thomas S. Cull	PHUS030354US	3411

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595 MINER ROAD
CLEVELAND, OH 44143

EXAMINER

ROZANSKI, MICHAEL T

ART UNIT	PAPER NUMBER
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3768

MAIL DATE	DELIVERY MODE
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11/21/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/572,777

Applicant(s)

CULL ET AL.

Examiner

Michael Rozanski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/21/06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-17 and 26-28 in the reply filed on 10/8/07 is acknowledged.

Newly submitted claims 26-28 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Applicant elected a method claim. Although applicant claims each apparatus is for performing the method of claim 1, Examiner notes that each of the limitations is an intended use recitation whereby the apparatus of each newly presented claim lacks sufficient structural limitations to distinguish from other MR apparatus that are capable of performing the method.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 26-28 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

Claims 26-28 are objected to because of the following informalities: The claims are improper dependent claims because they refer to apparatuses which depend from a method claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-8, and 10-17 are rejected under 35 U.S.C. 102(e) as being anticipated by **Anand et al** (US 6,639,211).

Anand et al disclose an apparatus and method for contrast-enhanced magnetic resonance angiography (MRA) including dividing k-space into a central region and annular peripheral regions. The central portion 300 has a round shape and is continuously and randomly sampled, creating a plurality of central data sets. The peripheral regions include at least two surrounding regions and the outermost surrounding region has a round inner perimeter and a square outer perimeter, but other geometries are contemplated (see figures 3 and 4; col 6, lines 33-64). The leading edge of a bolus of contrast agent in the volume of interest is detected after which portions of the peripheral portions are sampled, creating peripheral data sets. A magnetic resonance angiograph is then reconstructed from (i) the last central data set collected before the detection of bolus and (ii) the peripheral data sets collected after the detection of the bolus (col 2, lines 15-30) and processed by a video processor 84 for

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display on a monitor 86. Upon detection of the bolus, an edge detector 66 signals a trigger 70 to trigger the sequence control processor 40 to acquire a plurality of higher phase encode views 270, thereby synchronizing the acquisition of k-space samples in the central region (col 7, lines 23-35). Acquisition of the three dimensional angiogram is acquired with substantially zero latency between the detection of the bolus and acquisition of the angiogram.

Figure 5 shows an embodiment in which phase encode gradients are overlapped with read gradients, and later echos are time scaled accounting for less read points necessary for outer segments to cover an ellipsoid in k-space. Accordingly, Figure 6 shows a serpentine row-by-row scan trajectory through k-space. Therefore, a first row of k-space samples by traversing secondary coordinate positions in a positive direction at a first primary coordinate position, a primary coordinate magnetic field gradient is applied to move a second primary coordinate position, and a second row of k-space samples by traversing secondary coordinate positions in a negative direction at the second primary coordinate position. As such, these acquisition steps are repeated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Anand et al** in view of **Riederer et al** (US 5,122,747).

Anand et al substantially disclose all features of the current invention including row-by-row acquisition ordering, but do not disclose another type of ordering wherein the k-space samples are then sorted into row-by-row ordering. In the same field of endeavor, Riederer et al teach of spiral ordering (see figures 5-7), as well as sorting the samples into row-by-row ordering (see figure 4). It would have been obvious to one with ordinary skill in the art at the time the invention was made to incorporate the teaching of Riederer et al in order to scan a sample with a spiral trajectory in order to produce an image less susceptible to motion artifacts (col 3, lines 23-40).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Rozanski whose telephone number is 571-272-1648. The examiner can normally be reached on Monday - Friday, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


MR

 ERIC F. WINAKUR
PRIMARY EXAMINER